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KARIKARI, KWASI	

ART UNIT	PAPER NUMBER
2617	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/782,929	Applicant(s) TAKEDA ET AL.	
	Examiner Kwasi Karikari	Art Unit 2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 July 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 3-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 3-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *08/31/2006*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

1. The Art Unit location of your application in the USPTO has changed. To aid in correlating any papers for this application, all further correspondence regarding this application should be directed to Art Unit 2617.

2. Claim 2 has been cancelled.

Response to Arguments

3. Applicant's arguments, see remarks, filed 07/13/2006 , with respect to the rejection(s) of claim(s) 1 and 2-3-22 under 35 U.S.C. 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Palenius (U.S. 6,904,290),

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a

person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 1, 3-9 and 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shearer, III (U.S. 20030058826 A1), (hereinafter Shearer) in view of Palenius (U.S. 6,904,290), (hereinafter Palenius).

Regarding **claims 1 and 19**, Shearer discloses a multi-hop communication system configured by a radio control station (Hub access point (HAP 22), see Par. [0069] and Fig. 1) connected to a core network (multihop, multi-channel, wireless communication network, see Par. [0016]) and radio stations that relay a signal transmitted from other radio station (node 24,26 and 32 see Fig. 1), wherein, the radio control station comprises:

a control signal transmission/reception unit configured to transmit/receive a control signal for conducting communication with the radio station (HAP 22 may broadcast a count and time slot data to node 24 and 26, see Par. [0065]);
an information signal transmission/reception unit configured to transmit/receive an information signal; a communication route determiner configured to determine a communication route for the control signal and a communication route for the information signal by different independent processes (HAP 22 includes a timer 52, data port 54, processor 46, that controls transceiver 48 by transceiver's operation, allocating channel and when to commence transmitting and receiving, see Par. [0063-0064] and Fig. 7), and the radio station (nodes 24,26 and 32) comprises:

a control signal transmission/reception unit configured to transmit/receive the control signal; and an information signal transmission/reception unit configured to transmit/receive the information signal (nodes 24 and 26 includes processor 46, transceiver 48, a timer 52, and data port 54 and unit 48 may transmit and receive communication signal and and time slot data, see Par. [0063-0065])); and the radio station comprises: a control and an information signal transmission/reception units configured to transmit/receive the control and information signals (nodes 22,24,26 and 32 transfer data over the bi-directional path 30, see Par. [0042-44] and Fig.1); but fails to disclose that the control signal have lower bit rate than the information signal; and the communication route for the control signal is independent from the communication route for the information signal.

However Palenius teaches, the control signal have lower bit rate than the information signal; and the communication route for the control signal is independent from the communication route for the information signal (see col. 3, lines 41-50 and col. 4, lines 32-44).

It would therefore have been obvious to one of the ordinary skill in the art to combine the teaching of Palenius into the system of Shearer for the benefit of achieving a transmission system that uses higher downlink data rate and a lower uplink data rate (see col. 4, lines 32-44).

Regarding **claim 3,** Shearer discloses a radio control station (Hub access point (HAP 22), see Par. [0069] and Fig. 1) connected to a core network (multihop, multi-channel,

wireless communication network, see Par. [0016]) for controlling communication by a radio stations that relays a signals transmitted by other radio station, comprising:

a control signal transmission/reception unit configured to transmit/receive a control signal for conducting communication with the radio station (HAP 22 may broadcast a count and time slot data to node 24 and 26, see Par. [0065]);

an information signal transmission/reception unit configured to transmit/receive an information signal (HAP 22 includes a timer 52, data port 54, processor 46, that controls transceiver 48 by transceiver's operation, allocating channel and when to commence transmitting and receiving, see Par. [0063-0064] and Fig. 7); but fails to disclose that the control signal have lower bit rate than the information signal; and the communication router for the control signal is independent from the communication route for the information signal.

However Palenius teaches, the control signal have lower bit rate than the information signal; and the communication route for the control signal is independent from the communication route for the information signal (see col. 3, lines 41-50 and col. 4, lines 32-44).

It would therefore have been obvious to one of the ordinary skill in the art to combine the teaching of Palenius into the system of Shearer for the benefit of achieving a transmission system that uses higher downlink data rate and a lower uplink data rate (see col. 4, lines 32-44).

Regarding **claim 4,** Shearer discloses the radio control station according to claim 3, the communication route determiner determines a communication route for the information signal by a different independent process from the determination of the communication route for the control signal (HAP 22 includes a timer 52, data port 54, processor 46, that controls transceiver 48 by transceiver's operation, allocating channel and when to commence transmitting and receiving, see Par. [0063-0064] and Fig. 7).

Regarding **claim 5,** Shearer discloses the radio control station according to claim 3, the communication route determiner transmits a communication route acquisition request to the radio station for acquisition of a communication route, and the communication route determiner determines a communication route based on a response to the communication route acquisition request transmitted by the radio station (resource allocation process 60, performed by HAP 22, includes collecting path hop identity and time slot, see Par. [0070, 0072 and 0073] and Fig. 8).

Regarding **claim 6,** Shearer's teaching of processor 46, controlling the transceiver 48 by specifying transceiver of direction operation, channel over which to communicate and when to commence transmission and reception (see Par. [0064]), meets the limitation of radio control station according to claim 3, further comprising a communication channel controller configured to transmit a usage notification that indicates usage of a communication channel handled by the radio control station.

Regarding **claims 7,** Shearer's teaching of the task 112 sending allocation message to node 24 and instructing node 24 during which time slot/channel to transmit and receive data (see Par. [0087]), meets the limitations, the radio control station according to claim 3, the communication route determiner determines a communication route to the radio station and transmits a communication route determination notification that notifies the communication route to a radio station located on the communication route.

Regarding **claims 8,** Shearer's teaching of the task 112 sending allocation message to node 24 and instructing node 24 during which time slot/channel to transmit and receive data (see Par. [0087]), meets the limitation, the radio control station according to claim 7, the communication route determiner assigns a communication channel to be used in the radio station located on the determined communication route.

Regarding **claim 9,** Shearer discloses a radio station (nodes 24,26 and 32 see Fig. 1) conducting communication via a radio control station connected to a core network, comprising:

a control signal transmission/reception unit (processor 46) configured to transmit/receive the control signal; an information signal transmission/reception unit (transceiver 48) configured to transmit/receive the information signal; and

a communication route determiner configured to determine a communication route for the control signal and a communication route for the information signal (nodes 24 and 26 includes processor 46, transceiver 48, a timer 52, and data port 54 and unit

48 may transmit and receive communication signal and count and count and time slot data, see Par. [0063-0065] and Fig. 7); but fails to disclose that the control signal have lower bit rate than the information signal; and the communication route for the control signal is independent from the communication route for the information signal.

However Palenius teaches, the control signal have lower bit rate than the information signal; and the communication route for the control signal is independent from the communication route for the information signal (see col. 3, lines 41-50 and col. 4, lines 32-44).

It would therefore have been obvious to one of the ordinary skill in the art to combine the teaching of Palenius into the system of Shearer for the benefit of achieving a transmission system that uses higher downlink data rate and a lower uplink data rate (see col. 4, lines 32-44).

5. **Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shearer in view of Palenius and further in view of Haartsen (U.S. 6,576,266), (hereinafter Haartsen).**

Regarding **claim 10,** the combination of Shearer and Palenius fail to teach that the radio station according to claim 9, the communication route determiner transmits a usage inquiry to the radio station for inquiring usage of a communication channel handled by the radio control station and transmits/receives the information signal according to a usage notification that is a response to the usage inquiry.

Haartsen discloses an ad hoc communication system whereby remote terminals are locked to a base station(s) that acts as master (see col. 7, lines 1-7). Haartsen further teaches that channels used for communication links can be assigned by base station 210 and assignments are base on various consideration such as hop sequences currently in use and signal strength measurement or interference level (see col. 11, lines 57-65 and Fig. 7A).

It would therefore have been obvious to one of the ordinary skill in the art to combine the teaching of Haartsen into the system of Shearer and Palenius for the benefit of achieving a ad hoc communication system whereby channel assignment process is initiated at a base station.

Regarding **claim 11**, as recited in claim 9, Haartsen's further teaching of the base station's supply of the network characteristics and information, for a fast setup, to the requesting terminal (see col. 13, lines 11-36), meets the limitation, the radio station according to claim 9, further comprising a decision unit configured to decide whether or not communication is directly conducted with the radio control station based on a reception level of the control signal received by the control signal transmission/reception unit.

It would therefore have been obvious to one of the ordinary skill in the art to combine the teaching of Haartsen into the system of Shearer and Palenius for the benefit of achieving a ad hoc communication system whereby channel assignment process is initiated at a base station.

6. **Claim 12, is rejected under 35 U.S.C. 103(a) as being unpatentable over Shearer in view of Palenius and further in view of Haartsen and further in view of Chari et al., (U.S. 6,704,301), (hereinafter Chari).**

Regarding **claim 12,** as recite in claim 11, the combination of Shearer, Palenius and Haartsen fail to teach that the decision unit changes a threshold for the reception level according to a transmission speed of the information signal and to decide whether or not communication is directly conducted with the radio control station based on a result of comparison of the reception level and the threshold.

Chari teaches a routing network architecture including a server that periodically communicate to clients through a transmission and reception of beacon (see col. 2, lines 48-59 and Fig. 2). Chari further discloses that the link quality (being the reception level) of the beacon received at the client terminal determines whether the beacon is rebroadcast by the system and the link quality depends on traffic congestion, latency, thickness of pipeline (being the threshold and transmission speed), (see col. 3, lines 34-54, col. 5, lines 21-34 and col. 12, lines 31-50).

It would therefore have been obvious to one of the ordinary skill in the art to combine the teaching of Chari into the system of Shearer, Palenius and Haartsen for the benefit of achieving a system whereby a server in a communication system could use it's transmitted beacon to establish a communication route(s) to other clients in the system.

7. **Claims 13-18, are rejected under 35 U.S.C. 103(a) as being unpatentable over Shearer in view of Palenius and further in view of Chari et al., (U.S. 6,704,301) (hereinafter Chari).**

Regarding **claim 13,** as recite in claim 9, Shearer and Palenius fail to teach a first relay controller configured to transmit a relay control signal to other station for requesting a relay of the information signal and to set a communication route to the radio control station via the other station according to a response relay control signal that is a response to the relay control signal.

Chari teaches a routing network architecture including a server that periodically communicate to clients using a transmission and reception of beacon (see col. 2, lines 48-59). Chari further discloses that the clients use reverse beacon to communicate back to the server (see col. 3, lines 55-63, col. 4, lines 8-16 and Fig. 3A).

It would therefore have been obvious to one of the ordinary skill in the art to combine the teaching of Chari into the system of Shearer and Palenius for the benefit of achieving a system whereby a server in a communication system could use it's transmitted beacon to establish a communication route(s) to other clients in the system.

Regarding **claim 14,** as recite in claim 13, Shearer and Palenius fail to teach a communication route selector configured to select a radio station satisfying a prescribed

condition regarding a communication state if a plurality of the other radio station transmitted the response relay control signal.

Chari teaches a routing network architecture including a server that periodically communicate to clients through a transmission and reception of beacon (see col. 2, lines 48-59 and Fig. 2). Chari further discloses that the link quality received at the client terminal determines whether the beacon is rebroadcast by the system and the link quality depends on traffic congestion, latency, thickness of pipeline etc.
(see col. 3, lines 34-54 and col. 10, lines 27-46).

It would therefore have been obvious to one of the ordinary skill in the art to combine the teaching of Chari into the system of Shearer and Palenius for the benefit of achieving a system whereby a server in a communication system could use it's transmitted beacon to establish a communication route(s) to other clients in the system.

Regarding **claim 15,** as recite in claim 9, Shearer and Palenius fail to teach a second relay controller configured to receive a relay control signal requesting a relay of the information signal from other station, to transmit a response relay control signal that is a response to the relay control signal and to set a communication route from the other radio station to the radio control station.

Chari teaches a routing network architecture including a server that periodically communicate to clients using a transmission and reception of beacon

(see col. 2, lines 48-59). Chari further discloses a Level One beacons and Level Two beacons clients that evaluates the beacons, base on link quality, to consider a chosen path for clients in the network (see col. 12, lines 31-50).

It would therefore have been obvious to one of the ordinary skill in the art to combine the teaching of Chari into the system of Shearer and Palenius for the benefit of achieving a system whereby a server in a communication system could use it's transmitted beacon to establish a communication route(s) to other clients in the system.

Regarding **claim 16,** as recite in claim 15, Shearer and Palenius fail to teach the second relay controller transmits the response relay control signal notifying ability of the relay of the information signal based on a reception level of the received response relay control signal.

Chari teaches a routing network architecture including a server that periodically communicate to clients using a transmission and reception of beacon (see col. 2, lines 48-59).Chari teaches a routing network architecture including a server that periodically communicate to clients using a transmission and reception of beacon (see col. 2, lines 48-59). Chari further discloses a Level One beacons and Level Two beacons clients that evaluates the beacons, base on link quality such as signal-to-noise, to consider a chosen path for clients in the network (see col. 12, lines 31-50).

It would therefore have been obvious to one of the ordinary skill in the art to combine the teaching of Chari into the system of Shearer and Palenius for the benefit of

achieving a system whereby a server in a communication system could use it's transmitted beacon to establish a communication route(s) to other clients in the system.

Regarding **claim 17,** as recite in claim 14, Shearer and Palenius fail to teach an information indicating a number of hops from the other radio station to the radio control station is included in the response relay control signal, and the communication route selector selects a radio station based the number of hops included in the response relay control signal.

Chari teaches a routing network architecture including a server that periodically communicate to clients through a transmission and reception of beacon (see col. 2, lines 48-59 and Fig. 2). Chari further discloses that beacon received at clients determines the connectivity and the number of hops between clients and server (see col. 5, lines 21-34 and col. 12, lines 31-50).

It would therefore have been obvious to one of the ordinary skill in the art to combine the teaching of Chari into the system of Shearer and Palenius for the benefit of achieving a system whereby a server in a communication system could use it's transmitted beacon to establish a communication route(s) to other clients in the system.

Regarding **claim 18,** as recite in claim 14, Shearer and Palenius fail to teach an information indicating an interference level is included in the response relay control signal, and the communication route selector selects a radio station based the interference level included in the response relay control signal.

Chari teaches a routing network architecture including a server that periodically communicate to clients using a transmission and reception of beacon (see col. 2, lines 48-59). Chari further discloses that link quality is use to evaluate the beacon and the optimal path is chosen based on criteria such as the strength, congestion, and signal-to-noise level of the link in the path (see col. 12, lines 51-65).

It would therefore have been obvious to one of the ordinary skill in the art to combine the teaching of Chari into the system of Shearer and Palenius for the benefit of achieving a system whereby a server in a communication system could use it's transmitted beacon to establish a communication route(s) to other clients in the system.

8. **Claims 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shearer in view of Palenius and further in view of Gibbons et al., (U.S. 20050136951 A1), (hereinafter Gibbons).**

Regarding **claim 20,** as recited in claim 3, Shearer and Palenius fail to disclose that the route determiner determines whether or not the communication route for the information signal can be set based on a reception level of the control signal.

Gibbons teaches communication channel selection (which is equated with "communication route") method base on an acceptable pilot signal strength (which is equated with "reception level of the control signal") (see Par. [0058-59]).

It would therefore have been obvious to one of the ordinary skill in the art to combine the teaching of Gibbons into the system of Shearer and Palenius for the

benefit of achieving a system that include a method for selecting the best communication channel that can account for quality of communication over the selected communication channel.

Regarding **claim 21,** as recited in claim 3, Shearer and Palenius fail to disclose that the route determiner determines whether or not the communication route for the information signal can be set based on a reception level of the control signal.

Gibbons teaches communication channel selection (which is equated with "communication route") method base on an acceptable pilot signal strength (which is equated with "reception level of the control signal") (see Par. [0058-59]).

It would therefore have been obvious to one of the ordinary skill in the art to combine the teaching of Gibbons into the system of Shearer and Palenius for the benefit of achieving a system that include a method for selecting the best communication channel that can account for quality of communication over the selected communication channel.

Regarding **claim 22,** as recited in claim 19, Shearer and Palenius fail to disclose that the route determiner determines whether or not the communication route for the information signal can be set based on a reception level of the control signal.

Gibbons teaches communication channel selection (which is equated with "communication route") method base on an acceptable pilot signal strength (which is equated with "reception level of the control signal") (see Par. [0058-59]).

It would therefore have been obvious to one of the ordinary skill in the art to combine the teaching of Gibbons into the system of Shearer and Palenius for the benefit of achieving a system that include a method for selecting the best communication channel that can account for quality of communication over the selected communication channel.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Steer et al., (U.S. 20040157613 A1) teaches a self-selection of radio frequency channels to reduce co-channel and adjacent channel interference in a wireless distribution network.

Dillinger et al., (U.S. 20050085231 A1) teaches a method for re-routing a communication link including several radio communication system

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kwasi Karikari whose telephone number is 571-272-8566. The examiner can normally be reached on M-F (8 am - 4pm).
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Feild can be reached on 571-272-4090. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8566.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kwasi Karikari
Patent Examiner.

JOSEPH FEILD
SUPERVISORY PATENT EXAMINER